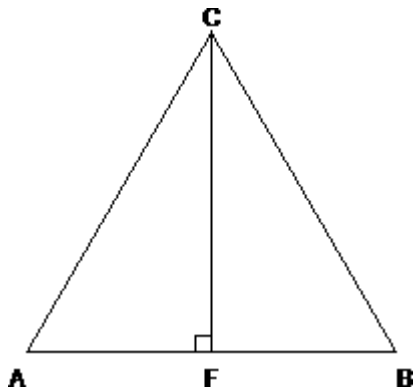


ACT Practice Items

Question 1

In the figure below $\overline{AC} \cong \overline{BC} \cong \overline{AB}$. \overline{AB} is 10 units long. What is the area, in square inches, of $\triangle ABC$?



- A. 12.5
- B. 20
- C. 25
- D. $25\sqrt{2}$
- E. $25\sqrt{3}$

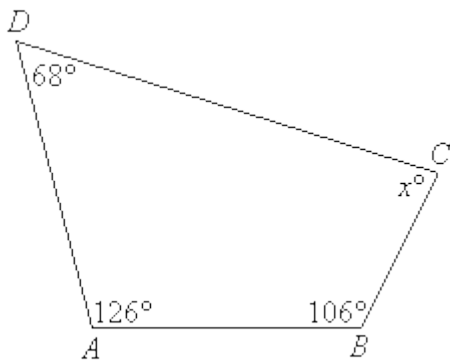
Answer Explanation

The answer is E.

The altitude of the triangle forms two 30° - 60° - 90° triangles. Using that relationship or the Pythagorean Theorem, the height of the triangle is $5\sqrt{3}$. Then using the formula for the area of a triangle, the final area is $25\sqrt{3}$.

Question 2

The figure below shows quadrilateral $ABCD$. What is the measure of $\angle C$?



- A. 120°
- B. 100°
- C. 90°
- D. 80°
- E. 60°

ACT Practice Items

Answer Explanation

The answer is E. The sum of the measures of the interior angles of a quadrilateral are 360° . The sum of the 3 angles have a measure of 300° , so the last angle must have a measure of 60° .

Question 3

What is the slope of the line in the standard (x, y) coordinate plane that goes through the points $(-2, 6)$ and $(6, 3)$?

A. $\frac{3}{8}$

B. $-\frac{3}{8}$

C. $\frac{8}{3}$

D. $-\frac{8}{3}$

E. $\frac{3}{2}$

Answer Explanation

The answer is B. Using the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$, students should calculate $m = \frac{3 - 6}{6 - (-2)} = -3/8$

Question 4

When graphed in the standard (x, y) coordinate plane, which of the following equations represents a line perpendicular to the line $y = 3x + 7$?

A. $x + 3y = 24$

B. $3x + y = 24$

C. $y = \frac{1}{3}x + 7$

D. $y = \frac{1}{3}x - 7$

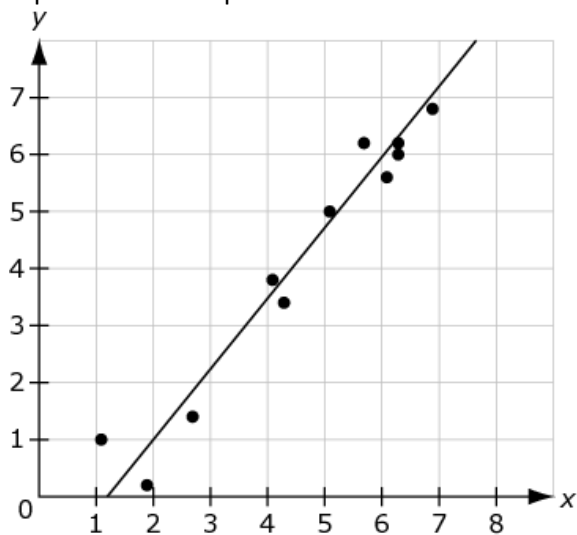
E. $-3x + y = 7$

Answer Explanation

The answer is A. Perpendicular lines have opposite reciprocal slopes, thus we want an equation with a slope of $-\frac{1}{3}$. When the first equation is rearranged into slope-intercept form it is $y = -\frac{1}{3}x + 8$.

Question 5

The scatterplot in the standard (x, y) coordinate plane below contains data points showing a strong linear correlation between the variables x and y . John drew the line shown to model the data. Which of the following answer choices represents the slope of the line?



- A. $\frac{4}{5}$
- B. 1
- C. $\frac{5}{4}$
- D. $\frac{8}{7}$
- E. $\frac{8}{4}$

Answer Explanation

The answer is C. Students can select two points that lie on the grid lines and compute rise over run. Using points $(2, 1)$ and $(6, 6)$ the slope is found to be $\frac{5}{4}$.

Question 6

The coordinates for the endpoints of \overline{AC} in the standard (x, y) coordinate plane are $(-5, -3)$ and $(6, 5)$. What is the y -coordinate of the midpoint of \overline{AC} ?

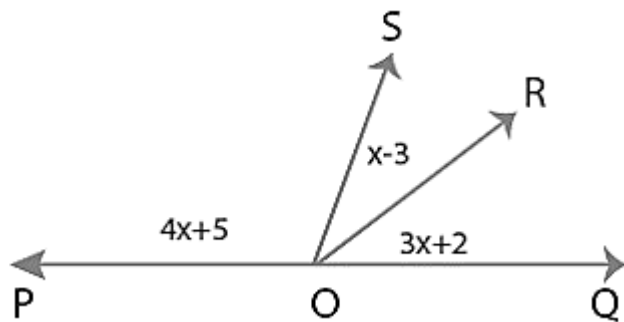
- A. -3
- B. -2
- C. 1
- D. 3
- E. 5

Answer Explanation

The answer is C. Using the midpoint formula, the y -coordinate is $\frac{-3+5}{2} = 1$.

Question 7

What is the degree measure of the smallest of the three angles formed by the line and two rays shown in the figure below?



- A. 19°
- B. 22°
- C. 68°
- D. 93°
- E. Cannot be determined from the given information

Answer Explanation

The answer is A. The sum of the measures of the three angles is 180° since it forms a straight line. Combining the three angle expressions we get $8x + 4 = 180$. The value of x is 22. The smallest angle is $x - 3 = 22 - 3 = 19$.

Question 8

A circle in the standard (x, y) coordinate plane is tangent to the x -axis at -4 and tangent to the y -axis at 4 . Which of the following is an equation of the circle?

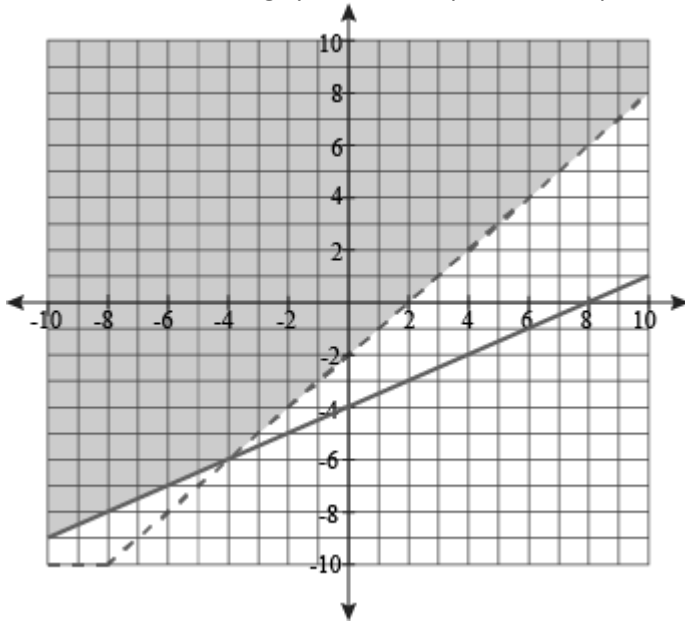
- A. $x^2 + y^2 = 4$
- B. $x^2 + y^2 = 16$
- C. $(x + 4)^2 + (y - 4)^2 = 4$
- D. $(x + 4)^2 + (y - 4)^2 = 16$
- E. $(x - 4)^2 + (y + 4)^2 = 16$

Answer Explanation

The answer is D. The points that the circle is tangent to represent the center of the circle at $(-4, 4)$. Using the standard form equation of a circle, $(x - h)^2 + (y - k)^2 = r^2$, and replacing the h and k with the x and y values of the center result in the equation in choice D.

Question 9

Which of the following system of inequalities is represented by the shaded region of the graph below?



- A. $y \geq \frac{1}{2}x - 4$ and $y > x - 2$
- B. $y \leq \frac{1}{2}x - 4$ and $y > x - 2$
- C. $y \geq \frac{1}{2}x - 4$ and $y < x - 2$
- D. $y > \frac{1}{2}x - 4$ and $y > x - 2$
- E. $y \geq \frac{1}{2}x - 4$ and $y \geq x - 2$

Answer Explanation

The answer is A. The shaded region is above the line for both inequalities so both symbols should be *greater-than*. The line with a y-intercept at -4 is a solid line, so it should have a \geq symbol.

Question 10

A ladder is leaned against a wall. The ladder is 15 ft. long and reaches 12 ft. up the wall. How many feet is the bottom of the ladder from the base of the wall?

- A. 3
- B. 4
- C. 9
- D. 15
- E. $\sqrt{369}$

Answer Explanation

The answer is C. The ladder and the wall form a right triangle. The hypotenuse is 15 ft. and one of the legs is 12 ft. Using the Pythagorean Theorem or the Pythagorean Triples (the triangle formed is a multiple of a 3-4-5 right triangle), we establish that the missing side is 9 ft.